CLAIMS

WHAT IS CLAIMED IS:

1. An expandable device, comprising:

an expansion member having a plurality of cells that are expandable from a closed position to an open position, each cell having a thin strut pivotably coupled to a thick strut.

2. The expandable device as recited in claim 1, wherein the thin strut and the thick strut of each cell are pivotably coupled by a pin joint.

3. The expandable device as recited in claim 1, wherein the thin strut and the thick strut of each cell are pivotably coupled by a ball and socket joint.

4. The expandable device as recited in claim 1, wherein the thin strut is coupled between a fixed end and a pivotable end.

5. The expandable device as recited in claim 1, wherein the expansion member comprises a tubular that undergoes radial expansion during expansion of the plurality of cells.

6. An expandable device , comprising:

an expansion member having a plurality of cells that are expandable from a closed position to an open position, each of the plurality of cells comprising a thick strut, a first thin strut and a second thin strut.

7. The expandable device as recited in claim 6, wherein the first thin strut is physically connected to the second thick strut and the second thin strut is disposed in abutting engagement with the thick strut.

8. The expandable device as recited in claim 6, wherein the first thin strut and the second thin strut are generally parallel.

9. The expandable device as recited in claim 6, wherein the first thin strut is longer than the second thin strut.

10. The expandable device as recited in claim 6, wherein the expansion member comprises a tubular.

11. An expandable device, comprising:

an expansion member having a plurality of cells that are expandable from a closed position to an open position, each of the plurality of cells comprising a spring member to hold the cell in the open position.

12. The expandable device as recited in claim 11, wherein the spring member comprises a horn.

13. The expandable device as recited in claim 11, wherein the spring member comprises a pair of horns.

14. The expandable device as recited in claim 13, wherein a thin strut and a thick strut extend between the pair of horns.

15. The expandable device as recited in claim 11, wherein each cell comprises a double horn cell.

16. The expandable device as recited in claim 11, wherein each spring member comprises an undulating spring member.

17. The expandable device as recited in claim 11, wherein the expandable member comprises a tubular that undergoes radial expansion during expansion of the plurality of cells.

18. An expandable device, comprising:

an expansion member having a plurality of cells that are expandable from a closed position to an open position, each of the plurality of cells comprising a thick strut and a thin strut, the thin strut having a plurality of flexible joints.

19. The expandable device as recited in claim 18, wherein each flexible joint comprises a thinned region.

20. The expandable device as recited in claim 19, wherein each thinned region undergoes plastic deformation during expansion from the closed position to the open position.

21. The expandable device as recited in claim 18, wherein the expansion member comprises a tubular.

22. An expandable device, comprising:

an expansion member having a plurality of cells that are expandable from a closed position to an open position, each cell having a thin strut coupled to a thick strut by a ligament.

23. The expandable device as recited in claim 21, wherein the thin strut and the thick strut of each cell are pivotably coupled by a pin joint.

24. The expandable device as recited in claim 21, wherein the thin strut and the thick strut of each cell are pivotably coupled by a ball and socket joint.

25. The expandable device as recited in claim 21, wherein the thin strut is coupled between a fixed end and a pivotable end.

26. A method of expanding a device, comprising:

creating a plurality of bistable cells in a wall of the device by coupling thin struts to corresponding thick struts through hinge joints; and

applying an expansion force to the wall in a direction that transitions the plurality of bistable cells from a contracted state to an expanded state.

27. The method as recited in claim 26, further comprising forming a plurality of locking mechanisms in the wall.

28. The method as recited in claim 26, wherein creating comprises coupling each thin strut to a corresponding thick strut through a pivotable hinge joint.

29. The method as recited in claim 26, wherein creating comprises coupling each thin strut to a corresponding thick strut through a flexible hinge joint.

30. The method as recited in claim 26, wherein creating comprises coupling each thin strut to a corresponding thick

strut by a hinge joint having a plastically deformable thinned region.

31. The method as recited in claim 26, wherein creating comprises creating the plurality of bistable cells in a tubular.

32. The method as recited in claim 31, wherein applying comprises applying a force in a radially outward direction.

33. The method as recited in claim 26, further comprising coupling at least one thin strut to the at least one thick strut by a spring member.

34. The method as recited in claim 26, further comprising coupling at least one thin strut to the at least one thick strut by a horn spring member.

35. An apparatus, comprising:

an expandable member having a plurality of cells that are expandable from a closed position to an open position, the plurality of cells comprising cells of differing sizes.

36. The apparatus as recited in claim 35, wherein the expandable member comprises a tubular.

37. An apparatus, comprising:

an expandable member having a plurality of cells that are expandable from a closed position to an open position, the plurality of cells comprising cells of differing configurations.

38. The apparatus of claim 37, wherein the expandable member comprises a tubular.